FIG. 1
CONVENTIONAL ART

```
┌──────────────┐      ┌──────────┐      ┌──────────┐
│   SOURCE     │      │          │      │          │
│ INFORMATION  │─────▶│ ENCODING │─────▶│MODULATION│─────┐
│  INPUTTING   │      │   UNIT   │      │   UNIT   │     │
│    UNIT      │      │          │      │          │     │
└──────────────┘      └──────────┘      └──────────┘     │
     110                  120               130          │
                                                         ▼
                                              ┌────────────────┐
                                              │ COMMUNICATION  │
                                              │    CHANNEL     │
                                              └────────────────┘
                                                   140       │
┌──────────────┐      ┌──────────┐      ┌──────────┐          │
│   SOURCE     │      │          │      │          │          │
│ INFORMATION  │◀─────│ DECODING │◀─────│DEMODULATION◀─────────┘
│  OUTPUTTING  │      │   UNIT   │      │   UNIT   │
│    UNIT      │      │          │      │          │
└──────────────┘      └──────────┘      └──────────┘
     170                  160               150
```

FIG. 2
CONVENTIONAL ART

	N_2	
	K_2	
K_1 INFORMATION SYMBOLS (SECTION I)		CHECKS ON ROW (SECTION II)
CHECKS ON COLUMNS (SECTION III)		CHECKS ON CHECKS (SECTION IV)

N_1

FIG. 3


```
310 ─ SOURCE
         INFORMATION
         INPUTTING
         UNIT

320 ─ BINARY
         CONVERSION
         UNIT

330 ─ ENCODING
         UNIT

340 ─ MODULATION
         UNIT

350 ─ COMMUNICATION
         CHANNEL

360 ─ DEMODULATION
         UNIT

370 ─ DECODING
         UNIT

380 ─ SOURCE
         INFORMATION
         OUTPUTTING
         UNIT
```

FIG. 4

START

BINARY INFORMATION SEGUNCE
*SYSTEMATIC GENERATOR MATRIX — S1

RS CODE
BINARY EQUIVALENT

BIT-LEVEL RS CODE BIT-LEVEL RS CODE — S2

CONPONENT CODE

GENERATING ROW AND COLUMM VECTOR — S3

FIG. 5

$$
G_b = \begin{vmatrix}
\begin{bmatrix} \alpha^{m-1} & g_{00} \\ & \vdots & \\ \alpha^0 & g_{00} \end{bmatrix} & \cdots\cdots\cdots & \begin{bmatrix} \alpha^{m-1} & g_{0N-1} \\ & \vdots & \\ \alpha^0 & g_{0N-1} \end{bmatrix} \\
\vdots & \cdots\cdots\cdots & \vdots \\
\begin{bmatrix} \alpha^{m-1} & g_{k-1,0} \\ & \vdots & \\ \alpha^0 & g_{K-1,0} \end{bmatrix} & \cdots\cdots\cdots & \begin{bmatrix} \alpha^{m-1} & g_{K-1N-1} \\ & \vdots & \\ \alpha^0 & g_{K-1N-1} \end{bmatrix}
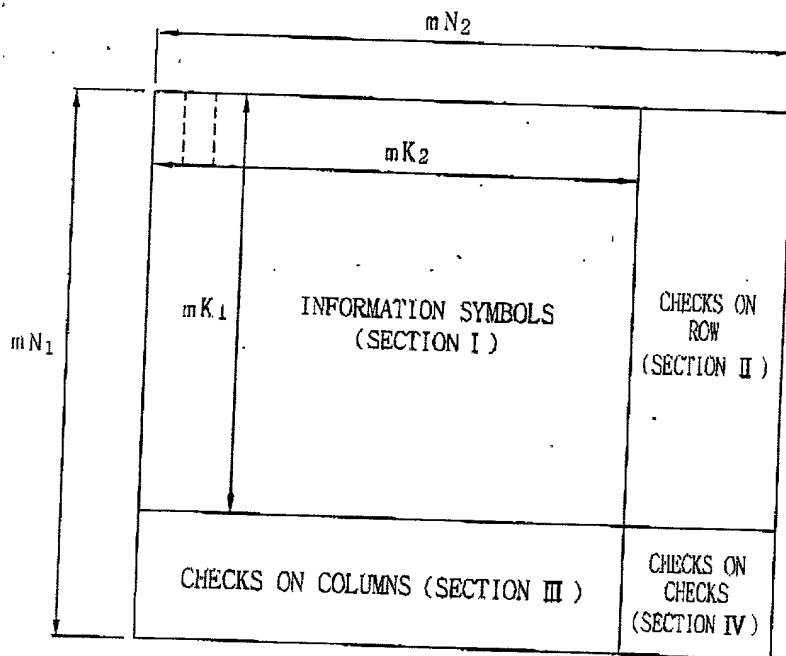\end{vmatrix}
$$

FIG. 6

mN_2

mK_2

mK_1

mN_1

INFORMATION SYMBOLS
(SECTION I)

CHECKS ON
ROW
(SECTION II)

CHECKS ON COLUMNS (SECTION III)

CHECKS ON
CHECKS
(SECTION IV)

FIG. 7

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & \alpha^4 & \alpha \\ 0 & 1 & 0 & 0 & 0 & \alpha^5 & \alpha \\ 0 & 0 & 1 & 0 & 0 & \alpha^5 & \alpha^3 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 & \alpha^4 & \alpha^3 \end{bmatrix}$$

G FOR (7,5) RS CODE

BINARY EQUIVALENT

```
1000000000   00000101011
0100000000   00000111100
0010000000   00000110010

0001000000   00000001011
0000100000   00000101100
0000010000   00000111010

0000001000   00000001111
0000000100   00000101110
0000000010   00000111011

0000000001   00000100100
0000000000   10000010010
0000000000   01000001001

0000000000   00100101111
0000000000   00010111110
0000000000   00001110011
```

G^b FOR (7,5) RS CODE

FIG. 8

ROM VECTOR DECODER — 810

COLUM VECTOR DECODER — 820

L_{cy}

$L_e^r(\hat{u})$

$L_e^c(\hat{u})$

$L(u)$

L_{cy}